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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/603,421	06/24/2003	David S. Miller	020579U1/QUALP855US	4323

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EXAMINER	
SOL, ANTHONY M	

ART UNIT	PAPER NUMBER
2619	

NOTIFICATION DATE	DELIVERY MODE
07/29/2008	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/603,421	MILLER ET AL.	
	Examiner	Art Unit	
	ANTHONY SOL	2619	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 May 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3,5-16 and 18-40* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,5-16 and 18-40* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

- A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 5/6/2008 has been entered.
- Claims 1, 3, 16, 29, 30, and 36-40 have been amended.
- Claims 1-3, 5-16, and 18-40 remain pending.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 3, 5, 16, 29, 30, 34 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,983,113 ("Asanuma") in view of U.S. Patent No. 5,638,361 ("Ohlson") and U.S. Patent No. 6,516,007 B1 ("Hong").

Regarding claims 1, 3, 5, 16, 29, 30, and 36,

Asanuma discloses, in an orthogonal CDMA system, receiving a first pilot signal and deriving at least one transmit timing characteristic from the received first pilot signal (col. 6, line 62 to col. 7, line 5, *a **pilot signal** is exchanged between the mobile stations PS1 to PS3 and the base station before the start of communication, which triggers a synchronization establishing operation. At this time, the base station BS1 allocates a channel to each of the mobile stations PS1 to PS3 by the CDMA scheme. Namely, the phase offset of each of **PN codes** and **orthogonal codes** is specified. As a result, for example, channels ch1, ch2, and ch3 are allocated to the mobile stations PS1, PS2, and PS3, respectively; col. 5, lines 1-7, The base stations BS1, BS2, . . . access the mobile stations existing in their own radio zones E1, E1, . . . by the **CDMA** scheme, using the radio frequency allocated to each of the base stations. In the CDMA communication, long codes and short codes are used as spread codes. For long codes, for example, 153600-chip PN codes are used. For short codes, for example, **64-chip orthogonal gold codes** are used;* Abstract, *With a CDMA mobile communication system of the present invention, the phase difference sensing circuit of the base station senses the phase **difference with respect to a reference phase** from the cross-correlation value of the up-link channel signals coming from mobile stations and sends timing control information for compensating the phase difference closer to zero to the mobile stations*).

Asanuma further discloses transmitting a second pilot signal in accordance with the derived at least one transmit timing characteristic (col. 7, lines 6-9, *The base station BS1 senses the phase **difference** between the reception phase of the*

orthogonal code included in the ***pilot signal coming from the individual mobile stations PS1 to PS3*** *and the* ***orthogonal code generated at the base station***).

Asanuma still further discloses receiving a control signal providing instructions to adjust the at least one transmit timing characteristic and adjusting, responsive to the control signal, the at least one transmit timing characteristic (col. 7, lines 10-18, *On the basis of the sense result of the phase difference, initial timing control information is created. The initial timing control information is transmitted to the corresponding mobile stations PS1 to PS3 via down-link channels.* ***When receiving the initial timing control information*** *from the base station BS1, each of the mobile stations PS1 to PS3* ***sets the amount of delay*** *in the delay circuit of the modulation circuit 46* ***on the basis of the control information*** *to prepare for the start of communication*).

Asanuma still further discloses that the control signal is based at least in part on a comparison of the second pilot signal and a reverse link reference signal (col. 7, line 58 - col. 8, line 2, *During the communication, at the base station BS1, the* ***phase difference between the orthogonal codes included in the individual up-link channel signals coming from the mobile stations PS1 to PS3 and the reference phase is always monitored****. The timing control information for making the phase difference zero is notified to the mobile stations PS1 to PS3 via down-link channels.* ***This enables variable control of the transmission timing of the mobile stations PS1 to PS3****. Specifically, a time alignment control loop for providing feedback control of the transmission timing of the up-link channel signal is formed between the base station BS1 and each of the mobile stations PS1 to PS3, as*

shown in FIG. 4).

Asanuma does not disclose that the reverse link reference signal is derived from a reference located at the ground station and delayed by a round trip delay to a reference point on earth through the satellite.

Ohlson discloses a **satellite** network communication system in which a plurality of subscriber handset terminals communicate with a ground hub station (claimed ground station) on traffic frequency channels using spread spectrum **orthogonal CDMA** transmissions. The hub station includes a control generator for generating a net entry control channel for communicating synchronization correction signals (**timing**, frequency and power) to subscriber handset terminals and a return link receiver. Each subscriber handset terminal has a subscriber unit control channel receiver for **receiving the control channel synchronization correction signals** and a subscriber unit return link transmitter connected to receive the synchronization correction signals **so that signals from all subscriber handset terminals arrive at the hub station in time, power and frequency synchronism**. The subscriber unit return link transmitter includes frequency hopped spread spectrum carrier such that none of the signals occupies the same frequency bin at the same time. The net entry control channel transmits small time and frequency correction signals to each of the plurality of subscriber handset terminals (Abstract). *In other words, the ground station generates correction signals (claimed generated at the ground station) and the satellite relays signals between the subscriber units and the hub station.*

Hong discloses that in the reference time establishment method for reverse channel synchronization in accordance with the present invention, the median value between the maximum and minimum **round trip delays** is selected as a reference time. A reference time is selected as described above in order to reduce the range where a mobile station should control a transmission time to be synchronized with the reference time. In other words, if the starting point of the transmission frame of a forward channel is selected as the reference time, the receiving time from a mobile station is placed between the reference time and the maximum **round trip delay**. In this case, the range of timing which should be controlled by a remote mobile station corresponds to the maximum round trip delay. However, if the median value of the maximum round trip delay is selected as a reference time, the maximum range which should be controlled is reduced in half (col. 2, lines 51-67).

It would have been *prima facie* obvious to one of ordinary skill in the art at the time of the invention was made to modify the orthogonal CDMA communication system of Asanuma to be used in a satellite communication system which generates correction signals at the ground hub station and transmit the correction signal through the satellite to the subscriber units as taught by Ohlson and in which the reference signal is derived from a median value between the maximum and minimum round trip delay as taught by Hong. One skilled in the art would have been motivated to make the combinations so that a subscriber can place telephone calls almost anywhere on the Earth, using a portable handset (Ohlson, col. 1, 21-24). As is well known, such a system would need satellites to overcome geographical obstructions such as mountains. A motivation

regarding the use of round trip delay of the reverse link reference signal is that a reference time is selected as described above in order to reduce the range where a mobile station should control a transmission time to be synchronized with the reference time (Hong, col. 2, lines 55-58).

3. Regarding claim 34,

Memory is inherently part of the terminal device/mobile station.

4. Claims 2, 8, 20, 31 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Asanuma in view of Ohlson and Hong, and further in view of Pub. No. US 2004/0147222A1 ("Walsh").

Regarding claims 2, 8, 20, 31, and 37,

Asanuma, Ohlson, and Hong do not explicitly discloses a reverse uplink receiver beam width of approximately 0.5°.

Walsh discloses a beam width of 0.5 degrees (para. 48).

It would have been *prima facie* obvious to one of ordinary skill in the art at the time of the invention was made to modify the reverse uplink receiver of Asanuma, Ohlson, and Hong combination to use 0.5 degrees beam width as disclosed by Walsh. One skilled in the art would have been motivated to make the combination to use a narrow beam width for higher power and frequency reuse as is well known in the art.

5. Claims 6, 7, 9-14, 18, 19, 21-28, 32, 33, 38 and 39 are rejected under 35

U.S.C. 103(a) as being unpatentable over Asanuma in view of Ohlson and Hong, and further in view of U.S. Patent No. 7,151,944 B2 ("Hashem").

Regarding claims 6, 7, 18, and 19,

Asanuma, Ohlson, and Hong do not disclose a pre-selected fractional part of a chip period such as one-eight of a chip or less.

Hashem discloses tracking commands which make use of the setting of the eighth bit to choose between ¼ and 1/8 chip (col. 13, lines 4-6; col. 15, lines 26-29).

It would have been *prima facie* obvious to one of ordinary skill in the art at the time of the invention was made to modify the orthogonal CDMA system of Asanuma, Ohlson, and Hong combination to bring the alignment to within 1/8 of a chip. One skilled in the art would have been motivated to make the combination to achieve time alignment synchronization (Hashem, col. 13, lines 1-12).

6. Regarding claims 9, 12, 21, 22, 25, 32, 33, 38 and 39,

Asanuma, Ohlson, and Hong do not disclose explicitly that the control signal directs the terminal to advance or retard its transmit timing.

Hashem discloses that the transmission timing alignment function 40 is coupled to the local clock function 42 and 41 and adds or subtracts timing offsets to the timing reference signal to alter the transmission timing (col. 16, lines 5-8).

It would have been *prima facie* obvious to one of ordinary skill in the art at the time of the invention was made to modify the orthogonal CDMA system of Asanuma, Ohlson, and Hong combination to include a timing alignment function as taught by

Hashem. One skilled in the art would have been motivated to make the combination to achieve time alignment synchronization (Hashem, col. 13, lines 1-12).

7. Regarding claims 10, 11, 13, 14, 23, 24, 26 and 27,

Asanuma, Ohlson, and Hong do not explicitly disclose advancing, adjusting, or retarding by a predetermined or specified amount.

Hashem discloses a range of changes in timing spanning from $1/8^{th}$ chip to 16 microseconds (col. 16, lines 15-18).

It would have been *prima facie* obvious to one of ordinary skill in the art at the time of the invention was made to modify the orthogonal CDMA system of Asanuma, Ohlson, and Hong combination to adjust timing by a specified amount as taught by Hashem. One skilled in the art would have been motivated to make the combination to achieve time alignment synchronization (Hashem, col. 13, lines 1-12).

8. Regarding claim 28,

Asanuma shows in fig. 3, a clock output 48 connected to a code modulator 46, and a control input 43 connected to a signal receiver 41.

9. Claims 15, 35 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Asanuma in view of Ohlson and Hong, and further in view of U.S. Patent No. 6,449,290 B1 ("Willars").

Regarding claims 15, 35, and 40,

Asanuma, Ohlson, and Hong do not disclose that the control signal directs the terminal to adjust its transmission frequency.

Willars discloses that in the CDMA cellular communications system, each base station normally transmits a pilot carrier signal in each of its sectors. This pilot signal is used by the mobile stations to obtain initial system synchronization and to provide robust time, **frequency** and phase **tracking** of the base station transmitted signals during a so called air interface chip synchronization phase (col. 2, lines 36-44).

It would have been *prima facie* obvious to one of ordinary skill in the art at the time of the invention was made to modify the orthogonal CDMA system of Asanuma, Ohlson, and Hong combination to use control signals to adjust frequency of the terminal as taught by Willars. One skilled in the art would have been motivated to make the combination to achieve tracking of the base station (Willars, col. 2, lines 36-44).

Response to Arguments

10. Applicant's arguments with respect to claims 1-3, 5-16, and 18-40 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANTHONY SOL whose telephone number is (571)272-5949. The examiner can normally be reached on M-F 7:30am - 4pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wing Chan can be reached on (571) 272-7493. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Anthony Sol/
Examiner, Art Unit 2619
7/26/2008

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7/20/08